REMARKS

The present application was filed on September 3, 1999 with claims 1-25.

Claims 1-25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,289,501 (hereinafter "Seshadri") in view of an article by G.M. Durant et al. (hereinafter "Durant") entitled "Implementation of a Broadband Equalizer for High-Speed Wireless Data Communications," cited by Applicants in their Supplemental Information Disclosure Statement filed May 28, 2002, and in further view of an article by S. Ariyavisitakul et al. (hereinafter "Ariyavisitakul") entitled "Reduced-Complexity Equalization Techniques for Broadband Wireless Channels."

In this response, Applicants amend claims 1, 8, 12, 19 and 24, and cancel claims 6, 7, 17, 18, 23 and 25. Applicants respectfully request reconsideration of the present application in view of the above amendments and the following remarks.

Independent claims 1, 12 and 24 have each been amended to clarify the manner in which the present invention can reduce the number of multiplications associated with a given signal processing operation in a receiver of a communication system. More particularly, with regard to claim 1, amendments have been made to specify that the claimed signal processing operation utilizes at least one selector to compute a product of a channel estimate and a given one of the transmitted symbols, and further that the selector receives as inputs real and imaginary parts of an element of the channel estimate, and generates as outputs real and imaginary parts of a product of the element of the channel estimate and a corresponding element of the given symbol, without requiring a multiplication operation. Similar amendments have been made to claims 12 and 24.

Support for the amendments can be found in the specification at, for example, page 7, line 20, to page 10, line 25, and in the computational structures illustrated in FIGS. 3-6, 8, 9, 11, 13, 14 and 16 of the drawings.

The Examiner argues in the Office Action at page 5, third paragraph, with regard to dependent claims 6-8 and 17-19, that the selector as described in those claims is obvious in view of Seshadri, Durant and Ariyavisitakul. Applicants respectfully disagree. The Examiner apparently acknowledges that Durant and Ariyavisitakul fail to teach or suggest the selector-related limitations of claims 6-8 and 17-19, but focuses instead on FIG. 3 of Seshadri and states that certain operations

"will become activated when appropriate." Applicants submit that, even if one were to assume for purposes of argument that this characterization of Seshadri is correct, the combined teachings of the cited references fail to meet the particular selector-related limitations in question.

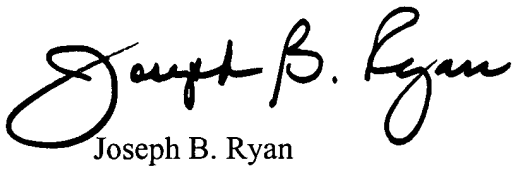
Independent claims 1, 12 and 24 as amended are believed allowable in view of the foregoing amendments.

Dependent claims 2-5, 8-11, 13-16 and 19-22 are believed allowable for at least the reasons identified above with regard to their respective independent claims.

In view of the above, Applicants believe that claims 1-5, 8-16, 19-22 and 24 are in condition for allowance, and respectfully request withdrawal of the §103(a) rejection.

A marked-up version of the claims showing the changes made by the present amendment is attached hereto.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (Amended) A method of processing information in a receiver of a digital communication system, the method comprising the step of:

applying a signal processing operation to a sequence of transmitted symbols, wherein the transmitted symbols correspond to points in a first modulation constellation [corresponding], the first modulation constellation corresponds to a rotated version of a second modulation constellation, and each of the transmitted symbols represents a particular number of information bits[, and further wherein use of the first modulation constellation allows the signal processing operation to be performed using a reduced number of operations relative to the number of operations required in conjunction with the second modulation constellation];

the signal processing operation utilizing at least one selector to compute a product of a channel estimate and a given one of the transmitted symbols;

wherein the selector receives as inputs real and imaginary parts of an element of the channel estimate, and generates as outputs real and imaginary parts of a product of the element of the channel estimate and a corresponding element of the given symbol, without requiring a multiplication operation.

Claims 6 and 7 have been canceled.

8. (Amended) The method of claim [7] 1 wherein the selector comprises first and second switches and first and second add/subtract [unit] units, the first and second switches each selecting one of the real or the imaginary part of the element of the channel estimate [coefficient] for application to a corresponding one of the add/subtract units, such that the add/subtract units compute elements of real and imaginary parts of an inner vector product.

12. (Amended) An apparatus for use in processing information in a receiver of a digital communication system, the apparatus comprising:

a signal processing circuit for processing a sequence of transmitted symbols, wherein the transmitted symbols correspond to points in a first modulation constellation [corresponding], the first modulation constellation corresponds to a rotated version of a second modulation constellation, and each of the transmitted symbols represents a particular number of information bits[, and further wherein use of the first modulation constellation allows the signal processing operation to be performed using a reduced number of operations relative to the number of operations required in conjunction with the second modulation constellation];

wherein the signal processing circuit comprises at least one selector configured to compute a product of a channel estimate and a given one of the transmitted symbols; and

wherein the selector receives as inputs real and imaginary parts of an element of the channel estimate, and generates as outputs real and imaginary parts of a product of the element of the channel estimate and a corresponding element of the given symbol, without requiring a multiplication operation.

Claims 17 and 18 have been canceled.

19. (Amended) The apparatus of claim [18] 12 wherein the selector comprises first and second switches and first and second add/subtract [unit] units, the first and second switches each selecting one of the real or the imaginary part of the element of the channel estimate [coefficient] for application to a corresponding one of the add/subtract units, such that the add/subtract units compute elements of real and imaginary parts of an inner vector product.

Claims 23 and 25 have been canceled.

24. (Amended) A method of processing information in a transmitter of a digital communication system, the method comprising the step of:

generating a sequence of transmitted symbols, wherein the transmitted symbols correspond to points in a first modulation constellation generated by applying a predetermined rotation to a second modulation constellation, and each of the transmitted symbols represents a

particular number of information bits[, and further wherein use of the first modulation constellation allows a signal processing operation in a corresponding receiver of the system to be performed using a reduced number of operations relative to the number of operations required in conjunction with the second modulation constellation];

the transmitted symbols being configured such that a signal processing operation applied in a corresponding receiver of the system is implementable utilizing at least one selector configured to compute a product of a channel estimate and a given one of the transmitted symbols;

wherein the selector receives as inputs real and imaginary parts of an element of the channel estimate, and generates as outputs real and imaginary parts of a product of the element of the channel estimate and a corresponding element of the given symbol, without requiring a multiplication operation.